ONTARIO MINISTRY OF ENVIRONMENT
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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

VILLAGE OF BANCROFT

COUNTY OF HASTINGS

June 1965

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Report on a water pollution survey of the village of Bancroft in the county of Hastings.

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Report on a

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of the

VILLAGE OF BANCROFT

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Division of Sanitary Engineering

June 1965

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Report on

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VILLAGE OF BANCROFT

INDEX

	PAGE NO.
Introduction	1
Interviews with Officials	1
Village of Bancroft	1
The York River at Bancroft	2
Water Uses	3
Water Supply	4
Surface Water Drainage	4
Sewage Works	4
Industry	6
Private Outfalls	7
Municipal Refuse Disposal Site	8
Sampling Procedure	8
Interpretation and Significance of Laboratory Results	9
Sample results	10
Summary	13
Recommendations	14

APPENDICES

Laboratory Results - Tables I to III

Figure 1 - Map of the Village of Bancroft Showing the Corporation Limits

Figure 2 - Map of the Commercial and Residential Section of the Village of Bancroft

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WATER POLLUTION SURVEY

of the

VILLAGE OF BANCROFT

INTRODUCTION

A water pollution survey of the Village of Bancroft was performed on November 4 and 5, 1964. Surveys of this type are made by the Ontario Water Resources Commission in order to locate potential and existing sources of surface water pollution. Recommendations are made concerning the abatement of conditions which adversely affect water quality.

INTERVIEWS WITH OFFICIALS

Discussions were held with the following officials during this survey:

Mr. M. J. McAlpine, P. Eng., Reeve;
Mr. J. W. Gordon, Clerk-Treasurer;
Mr. D. Easton, Chairman, Public Utilities Commission;
Mr. G. Barker, Superintendent of Works, Public Utilities Commission;
Mr. T. Raine, Public Health Inspector.

An unsuccessful attempt was made during this survey to contact Dr. O. W. Anderson, Medical Officer of Health. However, water pollution problems had been discussed with Dr. Anderson previously on September 11, 1964.

Appreciation is expressed to the village officials for the excellent assistance which they provided during this survey.

VILLAGE OF BANCROFT

The Village of Bancroft is located in the northern part of the County of Hastings. The York River flows in a southerly direction through the town.

Surface transportation routes serving Bancroft are the

Canadian National Railway and Highways 28, 62 and 500.

According to the 1964 Municipal Directory, the population of Bancroft is approximately 2,369. The approximate area of the village is 4,405 acres. The area encompassed by the corporation limits is large in comparison with the developed portion of the municipality, and includes some relatively undeveloped territory. This survey was confined to the York River and that part of the village which lies near the watercourse.

THE YORK RIVER AT BANCROFT

General

The York River drains Baptiste Lake and flows in a southerly direction through Bancroft, then pursuing a north-easterly course to empty into the Madawaska River south of the community of Combermere. Since the York River flows through the most intensively developed part of Bancroft, the various uses of the river water within the village are important. A control dam is located on the York River just downstream from Baptiste Lake and regulates the release of water for the development of power in Bancroft.

Hydrology

Hydrologic data pertaining to the York River have been obtained at the hydrometric station which is located approximately one-half mile downstream from the Highway 62 bridge in Bancroft. The drainage area upstream from this gauging station is 323 square miles. The following pertinent hydrologic data were obtained from the Department of Northern Affairs and National Resources:

Year	Mean Flow (in cfs)	Date	Max. Flow (in cfs)	Date	Min. Flow (in cfs)
1954	390	Apr. 19	2,040	Aug. 23	60
1955	431	May 1	1,480	July 11	93
1956	429	May 16	1,500	Oct. 23	99
1957	395	July 3	2,290	Sept. 9	76
1958	393	Apr.22-23	1,520	Aug. 20	93
1959	418	May 1	2,460	June 28	39
1960	522	Apr. 25	3,610	Oct. 1	98
1961	277	Apr. 27	1,790	Oct. 15	54
1962	271	Apr. 14	1,270	Sept. 13	58

Noting that the stream flow at the hydrometric station is affected by regulation upstream, the following concise data are provided for the years during which flow records have been compiled:

Mean Discharge (in cfs)	Max. Discharge (cfs)	Min. Discharge(cfs)
413	5,220 - Apr. 21, 1922	1-Sept. 26, 1950

WATER USES

Municipal

The York River receives the effluent from Bancroft's municipal sewage treatment facilities, as well as storm drainage flows from the municipality. Downstream from the dam which is located within the village, the Bancroft Public Utilities Commission utilizes the river water for the production of electricity at the power-house.

Industrial

River water is used to develop water power at the Bancroft Custom Woollen Mills. The plant is located downstream from the dam within the village. Reportedly, a limited volume of industrial waste water is discharged from these premises to the river.

Recreational

The public bathing area in Bancroft is located at the west bank of the York River south of the Station Street bridge.

WATER SUPPLY

The municipal water works was constructed as an OWRC project and was placed in service during the latter months of 1958. The water works is operated under the authority of the Division of Plant Operations, OWRC.

The source of water supply is Clarke Lake which is located approximately one mile east of the village and at a higher elevation. The intake conduit consists of 800 feet of 15-inch diameter corrugated metal pipe terminating in approximately 18 feet of water. The water flows to the village by gravity through a 12-inch diameter cast iron pipe which is approximately 7,400 feet in length. Chlorination of the water is effected at a small building located within the village. According to information obtained at the local Public Utilities Commission office, the premises served by the municipal water distribution system are reported as follows:

Industrial	-	4
Commercial (including schools)	-	52
Residential	-	264

SURFACE WATER DRAINAGE

Surface drainage flows discharge either to small tributaries of the York River or to municipal storm sewer systems which conduct these flows to the river. Some of the aforementioned tributaries have been improved to the extent that they assume the features of ditches or municipal drainage courses.

SEWAGE WORKS

A system of sanitary sewers and a communal sedimentation tank(or septic tank) serve the commercial area as well as part of the village lying on the west side of the York River. These facilities were constructed during 1959 as an OWRC project. The

locations of the sanitary sewers and the sewage treatment facilities are shown on Figure 2, which is appended to this report. Connections to the sanitary sewers are reported as follows:

Commercial (including creamery and dairy)	- 53
Residential	approximately - 42

Private sub-surface sewage disposal systems and privies are utilized in sections of the village where sanitary sewers are not available. The existence of some unsatisfactory sewage disposal facilities is probable, particularly where privies are situated on the banks of watercourses or where inadequately treated sewage flows gain access to surface waters. Reportedly, no formal inspection is provided in Bancroft to ensure that new septic tank systems and plumbing facilities are adequately designed and installed.

In the south-eastern part of Bancroft, a housing development established by Faraday Mines is served by sewers and a communal septic tank and tile bed system. Supervision of this sewage treatment facility will be assumed by the local Public Utilities Commission.

Sewage Pumping Stations

The municipal sanitary sewers conduct sewage flows to the main pumping station which is located adjacent to the municipal septic tank. A second pumping station is utilized in the sewer system. The locations of these units and the pertinent overflow arrangements are described as follows:

1. The main sewage pumping station is located at the sewage treatment site and delivers all incoming flows to the treatment facilities. This pumping station does not have an overflow arrangement.
2. An underground lift station is located on Station

street opposite the post office. This unit could overflow to the river during a period of emergency. Reportedly, the overflow outlet is capped during the summer months to ensure that such a discharge does not occur. An inspection indicated on November 5, 1964, that this pumping unit was designed to minimize the possibility of overflow.

Sewage Treatment Unit

This facility was designed for an average flow of 50,000 gallons per day. Treatment consists of sedimentation, with effluent chlorination being practised from May 15 to October 15. The 10-inch diameter outfall sewer has a submerged outlet in the York River. A conduit extending from the pumps to the outfall sewer permits by-passing of the sedimentation tank when required.

The efficiency of a sewage treatment facility usually is assessed by this Commission in terms of BOD and suspended solids removal. According to the following laboratory results pertaining to "grab" samples collected by OWRC staff on November 5, 1964, the reduction in five-day BOD and suspended solids was approximately 61 per cent and 67 per cent, respectively:

	5-Day BOD (ppm)	S O L I D S (ppm)		
		Total	Suspended	Dissolved
Raw sewage	65	514	208	306
Effluent discharge	25	354	69	285

INDUSTRY

The principal industrial firms located in Bancroft are listed as follows:

Name of Firm	Production
Bancroft Lumber Limited	Building supplies
Bancroft Custom Woollen Mills	Yarn
Bancroft Dairy Limited	Dairy products
Canada Packers Limited	Creamery operation
Downs Coulter and Company (Canada) Ltd.	Textile fabrics
Northland Novelty Company	Leather goods and manufacturing

Enquiries and investigations indicate that most of these premises discharge industrial waste flows to the municipal sanitary sewers. At least one firm, which is an exception is the Bancroft Custom Woollen Mills. An investigation revealed on November 5, 1964, that a limited volume of waste water resulting from the washing and dyeing of yarn is discharged directly to the York River in the downstream part of the village. This area is not served by municipal sanitary sewers. Since there was no waste discharge evident at the time of this inspection, samples were not obtained. However, this method of waste water disposal is unsatisfactory. Consideration should be given to the feasibility of installing a septic tank and tile bed system to receive these waste flows if there is no plan for providing municipal sanitary sewers in this area.

PRIVATE OUTFALLS

It is possible that, in some instances, sewage flows originating on private premises might gain access to watercourses in Bancroft. One instance was observed at a house which is located at the southern extremity of Alice Street and near the east bank of the York River. Although this residence was vacant at the time of this survey, local officials have reported that sewage flows from these premises have, in the past, gained access to the river. Reportedly, this condition was confirmed by dye-testing procedures. Since this residence is located only a short distance upstream from

the public bathing area, adequate precautions should be taken to ensure that the pertinent waste disposal procedures will be revised effectively before the house would become inhabited again.

MUNICIPAL REFUSE DISPOSAL SITE

The site utilized by the municipality for refuse disposal is located between Highway 62 and the York River in the northern part of the village. The refuse material is deposited on the edge of an embankment and falls into a gully from whence surface drainage flows would gain access to the river.

Subsequent to the receipt of a complaint concerning this refuse disposal site, an inspection thereof was made by Commission staff during 1961. The pertinent inspection report recommended that the municipality should relocate the refuse disposal site in order to prevent the possibility of stream pollution. The site still is in use. It is acknowledged that the municipal officials presently are aware of the undesirability of the site but have not selected an alternative location. Undoubtedly, the present site could not be utilized indefinitely without increasing the probability that refuse material will gain access to the watercourse and, therefore, a more appropriate site should be acquired.

SAMPLING PROCEDURE

Seasonal weather conditions prevailed during this survey with a light rainfall occurring during the forenoon of November 5, the date of sampling.

Samples were collected from the waters of the York River and its most pertinent tributaries in Bancroft, and from outfalls discharging thereto. Appended to this report is a map of the Village of Bancroft showing the locations of the York River sampling

points (Figure 1) and a second map of the village (Figure 2) showing the locations of stream and outfall sampling points in the more developed part of the municipality. The pertinent laboratory results are appended to this report in Tables I to III.

INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

The analyses employed to determine the quality of samples were: biochemical oxygen demand (BOD), solids, and the enumeration of coliform organisms. The chemical analyses were performed at the OWRC laboratory in Toronto. The bacteriological examinations (enumeration of coliforms) were performed at the Peterborough Regional Laboratory of the Ontario Department of Health.

The BOD of sewage, industrial wastes, or polluted waters, is the oxygen required during stabilization of the decomposible organic or chemical material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centigrade is reported. A high BOD is indicative of organic or chemical pollution. The BOD of a watercourse should not exceed four parts per million (ppm).

The analyses for solids include tests for total, suspended, and dissolved solids. The results are reported in ppm. The first test measures both the solids in solution and in suspension. The suspended solids indicate the measure of undissolved solids of organic or inorganic nature in suspension. Land erosion, sewage and industrial wastes, are significant sources of suspended solids. The effect of suspended solids in water is reflected in difficulties associated with water purification, and deposition in streams which could interfere with the habitat of aquatic life. The dissolved solids are a measure of those solids in solution.

The Peterbourgh Regional Health Laboratory utilized the Most Probable Number (MPN) method to provide an index of the number of coliform organisms per 100 cubic centimeters of the water sample. The Multiple Tube Fermentation technique was employed to perform the examinations. The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal sources. E. Coli organisms are members of the coliform group but definitely originate in the intestinal tract of humans or animals. It is the opinion of the OWRC that the presence of coliforms in a watercourse should not exceed 2,400 organisms per 100 ml of water.

SAMPLE RESULTS

The laboratory results are shown in appendices to this report as follows:

Table I - York River
Table II - Tributaries of York River
Table III - Municipal outfalls to the York River

York River

Although the quality of the York River water was satisfactory in the upstream part of Bancroft, and at the public bathing area which is located south of Station Street in the central part of the village, excessive coliform contents were revealed in the river water at Bridge Street and at the downstream limit of the municipality. The increase in coliforms is attributed to the influence of outfalls downstream from the bathing area.

Apparent pollution of the public bathing area has prompted the Medical Officer of Health to warn local residents that bathing in these waters is hazardous. The site was placarded during the summer of 1964. The adverse laboratory results pertaining to water samples collected at the bathing area for bacteriological examination

have been attributed, at least in part, to the contaminated flows discharging from the Madawaska Street storm sewer and sewage flows emanating from the aforementioned residence which is located near the river bank at the southern extremity of Alice Street. The following laboratory results pertain to water samples obtained from the bathing area by local officals during 1964:

Date of Sample	Total Coliforms (M.P.N. per 100 c.c.)	E. Coli
July 14	2,300	0
July 20	230	0
July 27	240,000	230
August 2	2,300	0
August 10	230	0
August 17	2,300	230
Sampled by OWRC Staff:		
September 11	1,600	-
November 5	23	0

Action is being taken by local officials to eliminate the sources of pollution, although the laboratory results tabulated above were excessive on one occasion only. Since objectionable outfalls were known to exist upstream, the precautions taken were quite justified until remedial action could be effected.

Tributaries of York River

The high suspended solids content revealed at sample point MYB. 125.63 is attributed to drainage from Highway 28 where sanitary sewer construction was in progress.

The laboratory results pertaining to samples collected from the watercourse which empties into the York River north of the municipal sewage treatment facilities indicate that sewage gains access to this tributary in or near the commercial section of the village. Sample point MYC. 125.33 is located at the mouth of the watercourse and sample point MYC. 125.57 is located upstream

at the junction of Bridge Street and Billa Street. This stream will be re-routed soon to empty into the river at Bridge Street.

Municipal Outfalls to York River

Flows were observed at only two municipal storm sewer outfalls on November 5, 1964.

At the municipal storm sewer outfall which is located on the east bank of the river at the foot of Madawaska Street(sample point MY. 125.65W), a high coliform content was present in the discharge. Since this sewer receives flows from a drainage course which originates on pasture land east of Spring Street, local officials have attributed the high coliform content in the sewer discharge to the excrement of farm animals. The presence of anionic detergents as ABS in these flows suggests as follows, however, that there might be undesirable domestic connections to this storm sewer system:

Date of Sample	Location	5-Day BOD (ppm)	SOLIDS Total	SOLIDS Susp.	SOLIDS Diss.	Anionic Detergents as ABS	Coliforms per 100ml M.F.
Sept. 11/64	Madawaska Street storm sewer discharge to York River.	2.0	200	7	193	0.5	6,800

(Samples collected by OWRC staff)

The area served by this municipal storm sewer lies beyond the municipal sanitary sewers which do not extend north of James Street.

A high coliform content was revealed at sample point MY. 125.05W where flows emanate from a municipal storm sewer on the west bank of the York River near Highway 62 in the southern part of Bancroft.

The quality of the effluent (sample point MY. 125.35T) from the municipal sewage treatment facilities was generally satisfactory for the degree of treatment provided. Although the

coliform content was high, this would be anticipated during a period when effluent chlorination was not being practised.

SUMMARY

A water pollution survey of the Village of Bancroft was performed by Commission staff on November 4 and 5, 1964. Investigations were made to obtain information concerning discharges to the York River within the village, and to determine the influence exerted thereby on the quality of the river water.

Bancroft has acquired a municipal sanitary sewer system which serves a limited but critical section of the village. Sewage treatment is provided by a municipal septic tank from whence the effluent is discharged to the York River. Effluent chlorination is effected from May until October of each year.

The laboratory results pertaining to water samples collected on November 5, 1964, indicate that the coliform content of the York River water increases abruptly in the southern part of Bancroft. The presence of untreated or inadequately treated sewage was revealed in one tributary of the York River within the municipality, and in the discharges from two municipal storm sewers to the river.

The absence of a programme to provide formal inspection of new septic tank systems and plumbing installations is regrettable. The existence of numerous privies near the banks of watercourses presents a potential hazard to stream quality. However, it is commendable to report that local officals are actively concerned with sewage disposal procedures which have become problematic.

The municipal refuse disposal site is located near the York River in the northern part of the village. Although it was not evident during this survey that any of the refuse material was

gaining access to the river, the proximity of this site to the watercourse indicates the desirability of selecting a more appropriate location for this operation.

Industrial waste flows are discharged from the Bancroft Custom Woollen Mills to the York River. There was no discharge evident at the time of this survey. This plant is located on the west bank of the river near the dam in an area which is not served by the municipal sanitary sewers.

RECOMMENDATIONS

Officials of the Village of Bancroft should continue their efforts to exclude objectionable discharges from the York River within the village.

Consideration should be given to the acquisition of a municipal refuse disposal site which will be more appropriate than the site which presently is employed. Such an operation should not be located where refuse material or drainage therefrom can gain access to a watercourse.

Although it was not possible to determine the quality of the industrial wastes which reportedly are discharged from the Bancroft Custom Woollen Mills to the York River, attempts should be made to exclude these untreated discharges from the watercourse.

All of which is respectfully submitted,

District Engineer: J. K. Theil
J. K. Theil

Approved by: _____
K. H. Sharpe, Director

/mh

TABLE I

YORK RIVER

ALL ANALYSES EXCEPT PH REPORTED IN
PPM UNLESS OTHERWISE INDICATED

SAMPLE POINT NO.	LOCATION	5-DAY BOD	TOTAL	SUSP.	DISS.	ANIONIC DETERGENTS AS ABS	BACTERIOLOGICAL EXAMINATION MOST PROBABLE NUMBER /100 ML TOTAL COLIFORMS	E. COLI
MY. 128.84	YORK RIVER AT THE UPSTREAM LIMIT OF BANCROFT	1.1	80	1	79	0.0	23	0
MY. 126.42	YORK RIVER OPPOSITE THE "EAGLE'S NEST"	0.9	94	2	92	0.0	23	23
MY. 125.54	YORK RIVER AT PUBLIC BATHING AREA SOUTH OF STATION STREET	1.1	92	1	91	0.0	23	0
MY. 125.28	YORK RIVER AT BRIDGE STREET	0.8	102	1	101	0.0	240,000 +	2,300
MY. 124.18	YORK RIVER NEAR DOWNSTREAM (SOUTH) LIMIT OF BANCROFT	0.7	68	1	67	0.0	21,000	21,000

TABLE II

TRIBUTARIES OF YORK RIVER

ALL ANALYSES EXCEPT PH REPORTED IN PPM UNLESS OTHERWISE INDICATED

SAMPLE POINT NO.	LOCATION	5-DAY BOD	TOTAL	SUSP.	DISS.	BACTERIOLOGICAL EXAMINATION MOST PROBABLE NUMBER/100 ML TOTAL COLIFORM	E. COLI
MYA. 125.97	TRIBUTARY FLOWING PAST MUNICIPAL WATER WORKS CHLORINATION BUILDING TO RIVER	0.5	156	3	153	23	0
MYB. 125.63	TRIBUTARY OF YORK RIVER (WEST BANK) - OPPOSITE MADAWASKA STREET	1.6	3,394	3,032	362	2,300	0
MYC. 125.33	IMPROVED WATERCOURSE ON EAST BANK OF RIVER NORTH OF MUNICIPAL SEWAGE WORKS	12.0	196	10	186	240,000 +	230
MYC. 125.57	AFOREMENTIONED WATERCOURSE UPSTREAM AT JUNCTION OF BRIDGE STREET AND BILLA STREET	---	---	---	---	23	23

TABLE III

MUNICIPAL OUTFALLS TO THE YORK RIVER

ALL ANALYSES EXCEPT PH REPORTED IN PPM UNLESS OTHERWISE INDICATED

SAMPLE POINT NO.	LOCATION	5-DAY BOD	TOTAL	SUSP.	DISS.	BACTERIOLOGICAL EXAMINATION MOST PROBABLE NUMBER/100 ML TOTAL COLIFORMS	E. COLI
MY. 125.65W	MUNICIPAL STORM SEWER DISCHARGING ON EAST BANK OF RIVER AT FOOT OF MADAWASKA STREET	1.1	158	34	124	240,000	2,300
MY. 125.56(W)W	MUNICIPAL STORM SEWER ON WEST BANK OF YORK RIVER AT NORTH SIDE OF STATION STREET		NO FLOW				
MY. 125.56(E)W	MUNICIPAL STORM SEWER ON EAST BANK OF YORK RIVER AT NORTH SIDE OF STATION STREET		NO FLOW				
MY. 125.54W	MUNICIPAL STORM SEWER ON EAST BANK OF YORK RIVER AT SOUTH SIDE OF STATION STREET		NO FLOW				
MY. 125.46W	MUNICIPAL STORM SEWER ON EAST BANK OF YORK RIVER APPROXIMATELY 500 FT. SOUTH OF STATION STREET		NO FLOW				
MY. 125.35T	OUTFALL FROM MUNICIPAL SEWAGE TREATMENT PLANT	25.0	354	69	285	240,000 +	24,000
MY. 125.30W	MUNICIPAL STORM SEWER OUTFALL ON EAST BANK OF RIVER SOUTH OF MUNICIPAL SEWAGE TREATMENT PLANT		NO FLOW				
MY. 125.29(W)W	MUNICIPAL STORM SEWER OUTFALL ON WEST BANK OF RIVER AT NORTH SIDE OF BRIDGE STREET		NO FLOW				
MY. 125.29(E)W	MUNICIPAL STORM SEWER OUTFALL ON EAST BANK OF RIVER AT NORTH SIDE OF BRIDGE STREET		NO FLOW				
MY. 125.05W	MUNICIPAL STORM SEWER OUTFALL ON WEST BANK OF YORK RIVER NEAR HWY. 62 IN SOUTH PART OF BANCROFT	0.9	156	1	155	23,000	23

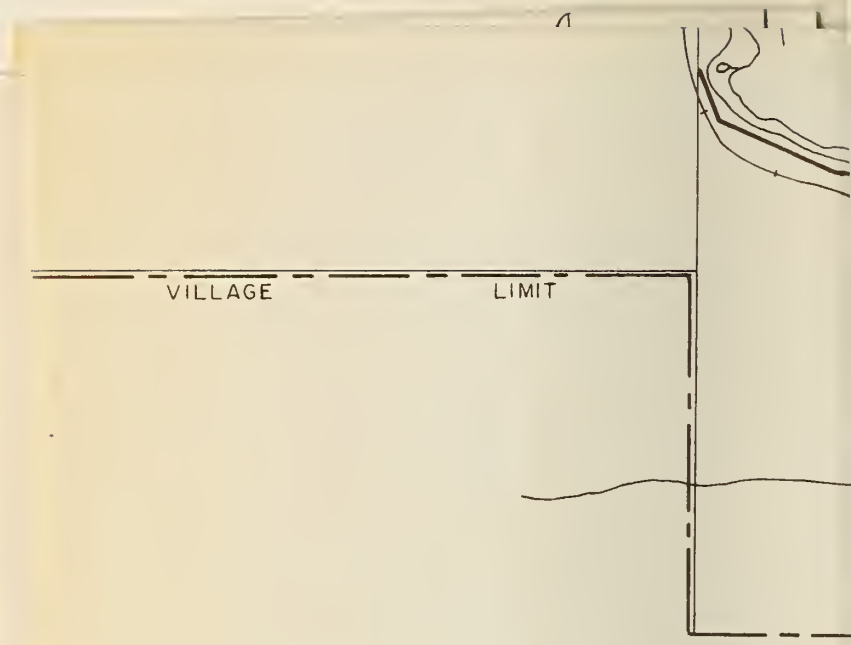
ONTARIO WATER RESOURCES COMMISSION

FIGURE I

VILLAGE OF BANCROFT

WATER POLLUTION SURVEY-1964

SCALE NOT TO SCALE	
DRAWN BY L L B	DATE APRIL, 1965
CHECKED BY	DRAWING No 65-60



TREAM AND MILEAGE

LEGEND

MY-125.28 – SAMPLING POINT SHOWING STREAM AND MILEAGE

MY-125.05 W – STREAM AND MILEAGE AT OUTFALL – TYPE OF OUTFALL

OUTFALL SYMBOL LETTERS

W – MUNICIPAL STORM SEWER
T – SEWAGE TREATMENT PLANT

——— – MUNICIPAL SANITARY SEWER

ONTARIO WATER RESOURCES COMMISSION

FIGURE 2

VILLAGE OF BANCROFT
WATER POLLUTION SURVEY 1964

SCALE: 200 0 400 800 FEET	
DRAWN BY: R.W.	DATE: APRIL 1965
CHECKED BY:	DRAWING No: 65—63